

The Really Useful Guide to Networking

Inside:

- Networking resources
- Acorn Access
- Practical implications

Something for everyone...

THERE was a time when the main reason for installing school networks was to cope with the tidal wave of floppies – and cope they did. But if you still think that's what networking is all about, you're in for a big surprise.

This special Arc Networking Supplement coincides with the launch of a new range of Acorn networking solutions, to give you and your pupils quick and easy access to the Internet as well as providing whole school networks. In addition, these solutions make precious multimedia resources available to all users across an entire campus, linking Apple Macs, PCs and Acorn machines in a single, seamless network.

If you've never taken the network plunge, you couldn't find a better or more exciting time to join in the fun. If you've managed so far with Econet and pre-RISC OS 3.1 technology, this is the time to upgrade. And if you're a state-of-the-art networking buff, now is the time to take a close look at what Acorn has to offer – more competitive, in terms of price and performance, than anything else on the market.

Our Really Useful Networking Guide has something for everyone.

Martin Newman

The Really Useful Networking Guide is a supplement to Arc 7 – published by Acorn Computers

What's in

THE average school has three traditional levels of access to resources for curriculum support. First, there are books located in the classroom itself. Second, a student can go to the school library which houses encyclopaedias and other reference materials. And third, there are town or community libraries with broad collections of periodicals and other publications not usually available in schools.

Curriculum resources

In today's educational environment, the definition of *having access to good curriculum resources* is rapidly expanding. It still means good textbooks, good teaching and good libraries. But it also means access to resources available through information technology – particularly multimedia computing.

Some would contend that computer resources have taken over as the prime means of access to curriculum support. Whether that statement is true for your school or not, it is possible to get more out of your IT – and your pupils – by allowing your school computers to fit

into the traditional model of three levels of accessing information.

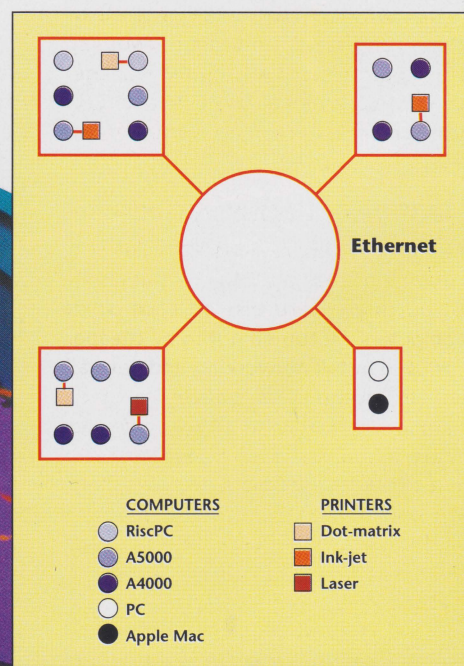
LANs and WANs

A standalone computer can be used to serve the needs of individual pupils and teachers in class. Alternatively, a good department or campus-wide network – often referred to as a Local Area Network or LAN – means that several users can simultaneously access information, CD-ROM, printing and other work resources normally only available by walking to another part of the building.

The third option is a Wide Area Network (WAN), such as Internet or e-mail, it is possible for users to share and obtain resources from libraries anywhere in the world. All these resources are obviously available as paper-based information. The difference with networking is that you can access them all without leaving the classroom.

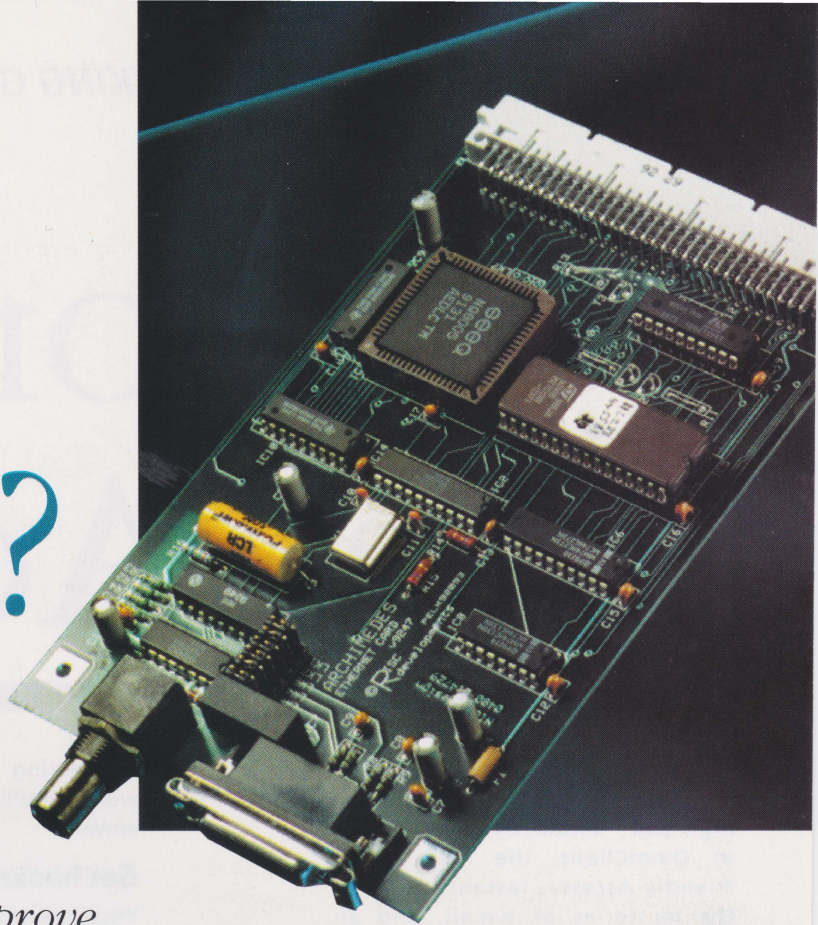
Whole school networks

Good computer networking reflects a school's teaching style and teaching



it for schools?

The ways in which computers are used in schools are as diverse as schools themselves. Yet all schools can use computer networking to improve the learning effectiveness of their pupils



priorities in terms of providing the best possible management of resources for improved learning effectiveness. This means that some schools might prefer to have *clusters* of three to five computers in designated areas throughout the building, while others will choose to place any number of computers in every classroom, not to mention the administrative offices.

But why bother to connect all of these computers? How can networking contribute toward the better management of educational resources and facilitate increased learning achievements among our pupils?

Hard discs versus networks

Firs Farm Primary School in Palmers Green was looking into the possibility of putting a hard disc on each of its computers. "It turned out to be cheaper for us to install networking and have all of the computers obtaining their resources," explains IT co-ordinator Mary Nicholls. "Now when I want to put some new software on the system, I've only got to store it on one machine and it's available on all of them. And we no longer need to be concerned about losing floppy discs."

The staff at Isebrook Special School in Kettering feel that networking has allowed them to

deliver a greater range of appropriate software into each classroom. "The unification of machines and printers makes whole school development much easier and more efficient," comments teacher Kevin McHenry. "The network allows pupils to do a piece of work in one room and finish it off later in another. This is particularly important for physically disabled pupils who require a computer for their written work."

"We're looking to add CD-ROM, video and PhotoCD to our network in the near future. These will not only be used to support the curriculum, but also in the reprographic and administrative areas. We'll soon also be using the Internet world-wide network which we feel will contribute greatly to the learning of our pupils."

Centralised management

Steeple Morden School, near Royston in Hertfordshire, has all of its classroom computers on networks. "Networks allow us to centralise the management of our curriculum resources," explains Shelagh MacDonald, Deputy Head at the school. "They also mean that those who are interested in computers and want to spend time and get involved with them can do so, while those who are just interested in the educational aspect can click on the program and

they're in. The end result is that computers are being universally used in all of the classrooms, on a regular basis, without the concern of time-tables."

Whatever a school's administrative or teaching style, today's educational environment requires the highest possible access to curriculum resources for improved learning effectiveness.

Within schools, computer networks help toward that goal by centralising resource management, economising both time and hardware needed to control or access resources, and providing an increased use of IT throughout the curriculum.

Going beyond the school, the electronic accessing of information through e-mail and the Internet provides resources literally at the pupils' fingertips.

Networking initiatives

- 1983** The Government announced an initiative to put a computer in every school
- 1989** The Government updated the initiative, the aim now being to put a computer in every classroom
- 1992** The Government again updated the initiative, to one computer for every 12 pupils
- 1995** Time for the Government to be funding schools on to the Net?

Any school which is up to 1989 standards should now be implementing the resource of computer networking for increased learning effectiveness.

Solutions from Acorn

THE new portfolio of Acorn networking solutions includes the blistering high-end connectivity software of OmniClient, the multimedia-friendly Access+, instant access to the mysteries of e-mail, and an even more flexible Level 4 network system.

Acorn offers appropriate and flexible networking solutions which accommodate the wide range of teaching and administrative needs found in today's schools.

Whether you are interested in whole school networking or

connecting to the out-of-school world, you'll find that Acorn has an answer.

Get hooked

Your easiest entry point to simple yet efficient networking is via Acorn Access. This complete solution comes with its own network cards and cabling – it's literally a question of plug-in-and-play.

If you want to share the following on a peer-to-peer and/or site-wide basis: hard discs, printers, applications, CD-ROMs – movies and high-quality stills, or to eliminate floppies, you

ought to be looking at Acorn Access Release 2. Making the best use of precious multimedia resources is a number one classroom priority. If you want everything that Acorn Access gives you plus simple multimedia sharing, password protection for information on a peer-to-peer and/or site-wide basis, then Access+ is the ideal solution.

Acorn's new Internet products cut straight through to the electronic highway, starting with Acorn InterTalk. So if you want to communicate direct between RISC OS and non-RISC OS machines, send and receive messages

What schools say

Networking has increased the IT confidence of our teachers, which has had a knock-on effect to the children. We chose Acorn Access because it's easy to use. It works and it's brilliant!

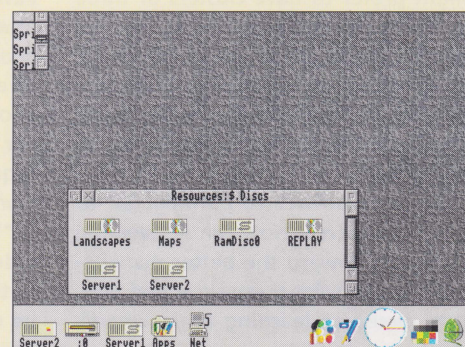
Jane Jones, IT Co-ordinator, Priory Infant School, Cambridge

We're committed to networking. We started off with only one room and it mushroomed from there into eight networks spread over the campus, all using Acorn's Level 4 software. We hope to build on our Acorn Ethernet system, which has proven flexible and well-suited to our school.

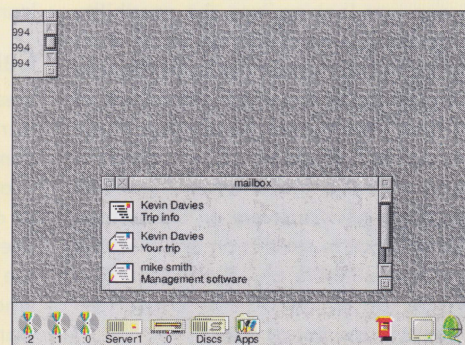
**Helen Huggup, Network Manager,
Wath Comprehensive School, Rotherham, South Yorkshire**

Learning how to use the network plays an important part in understanding how computers are used in everyday life. Internal e-mail from the members of one class to another mimics the distribution of e-mail within large companies. Our Acorn Access+ network is proving very useful in sharing access to the CD-ROM drive and also in sharing the hard drives. When pupils create very large files of text and pictures, and save them on the local hard drive in a specially created and shared Data directory, they can later recall their work very quickly via the Access+ network, even when sitting at another computer.

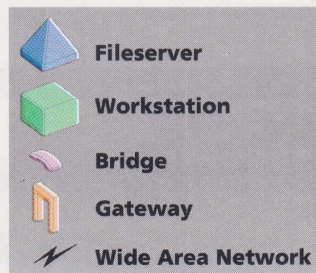
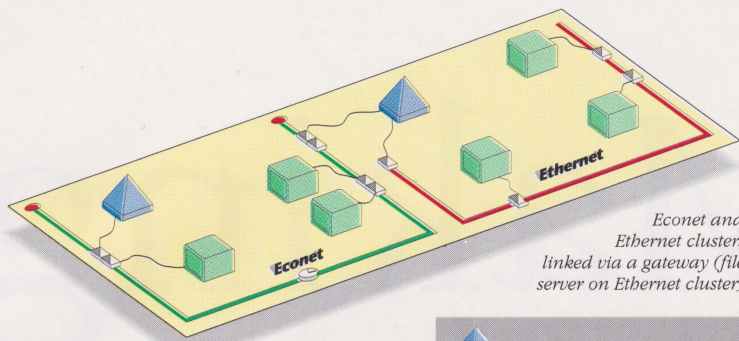
Jane Handcock, Head of IT, Perse School for Girls, Cambridge



CD-ROMs are catered for and located in the disc window



Click on the mailbox – two of the three messages have already been read



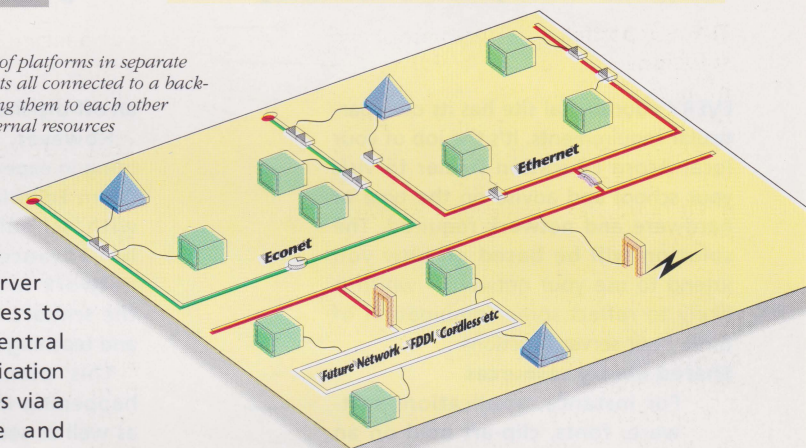
site-wide, communicate with anyone in the world, join a bulletin board, set up your own bulletin board or protect yourself from the dangers of unwanted data, then Acorn InterTalk is the product for you. It will also be updated by Acorn in 1995 to include a World Wide Web browser.

Total connectivity is at the heart of Acorn's brand-new, high-end OmniClient mixed environment networking solution, offering some of the highest levels of connectivity in the industry. If you want to connect RISC OS computers to PC, Unix or Apple stations heterogeneous peer-to-peer workgroups or ensure unrivalled high-end performance, then you're ready for OmniClient.

Acorn is upgrading its Level 4 networking operating system to respond to increased demand for flexibility. The

new version provides efficient application, and server and printer sharing access to information from a central server, as well as communication with non-RISC OS machines via a standard set interface and updated CD-ROM support.

A number of platforms in separate departments all connected to a backbone linking them to each other and to external resources



Networking definitions

LAN Local Area Network: network contained within one school campus.

WAN Wide Area Network: network connecting school to school, country to country, continent to continent.

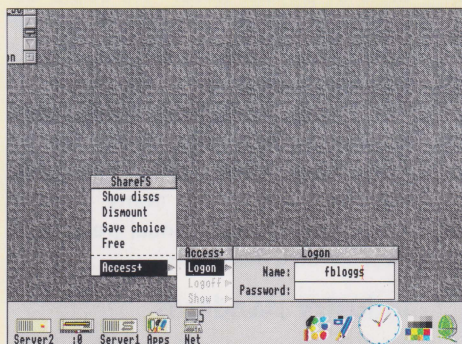
There are two basic types of whole school networking:

Peer-to-peer networking

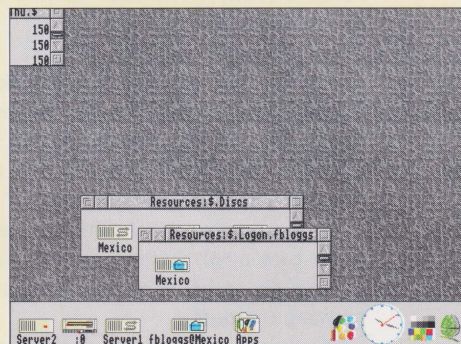
Each computer's hard disc, CD-ROM or printer can be used by any other machine on the network (Access and Access+).

Client-server networking

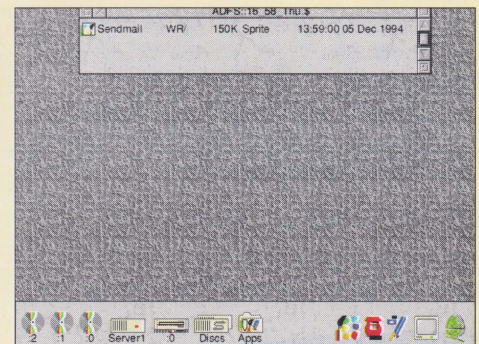
One central server computer is dedicated to providing disc space and applications for all the other client computers connected to it on the network. Each client machine makes use of the resources on the server (Level 4 and OmniClient).



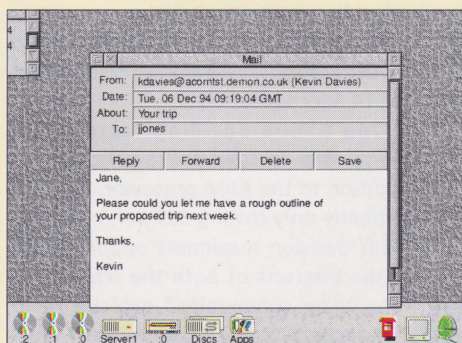
A user or group can log on to private data...



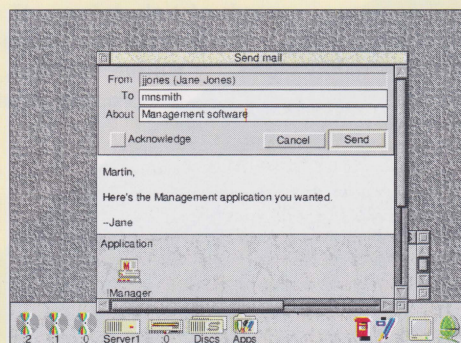
...giving access to a host of resources



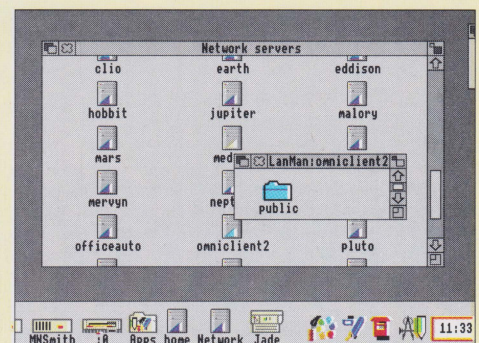
Mail ready and waiting for a client to access it



Access a message and this is what it looks like



Drag what you want to send into the window



Via OmniClient all protocol modules loaded make another range of file servers available

More networks were installed in UK schools in the last two years than during the whole of the previous decade. Paul

Richardson, of Plymouth-based Acorn Education Dealer, ExpLAN looks at the practical implications for schools considering a network

Making

EVERY educational site has its own particular requirements. It's the job of your local Acorn Education Dealer to visit your school and advise on the type of hardware and network required. The solution will be based on how you intend to use your network – which is likely to reflect some combination of three basic server functions:

Shared library resources

For instance, applications software, fonts, clip-art held on an applications server

File server

Storage of users' files on a central computer

Other servers

Normally shared printing, but also teletext, diary, CD-ROM and database servers and so on.

Off the shelf or tailor-made?

It's perfectly possible for a school to work out its own requirements and buy

an off-the-shelf solution.

However, many schools prefer to bring in expert advice in the form of an Acorn Education Dealer who will meet with school staff several months in advance to plan the best network infrastructure to support the school's curriculum requirements and teaching style.

This planned approach is now happening increasingly with primary as well as secondary schools. One such is Beaford County Primary in rural Devon, with four new classrooms and a new network.

For Jeremy Tudge, the IT Co-ordinator, "the benefits of networking in primary education were immediately apparent. It has speeded up the process of learning and has eliminated disc swapping by pupils."

Almost every school will require at least one applications server, each of which may provide resources to many computers.

Most sites also want shared printing across the network but few have been implementing a file server for client data. That's surprising when, in the words of Nelson Perry, IT Co-ordinator at Cheadle Hulme School, a properly installed

file server can revolutionise teaching methods. This prestigious public school in Cheshire has had five separate Acorn networks for the last two years.

However, this summer, ExpLAN upgraded the application servers and interlinked the clusters to provide total inter-machine communication. Now all 44 computers can access a new Risc PC file server.

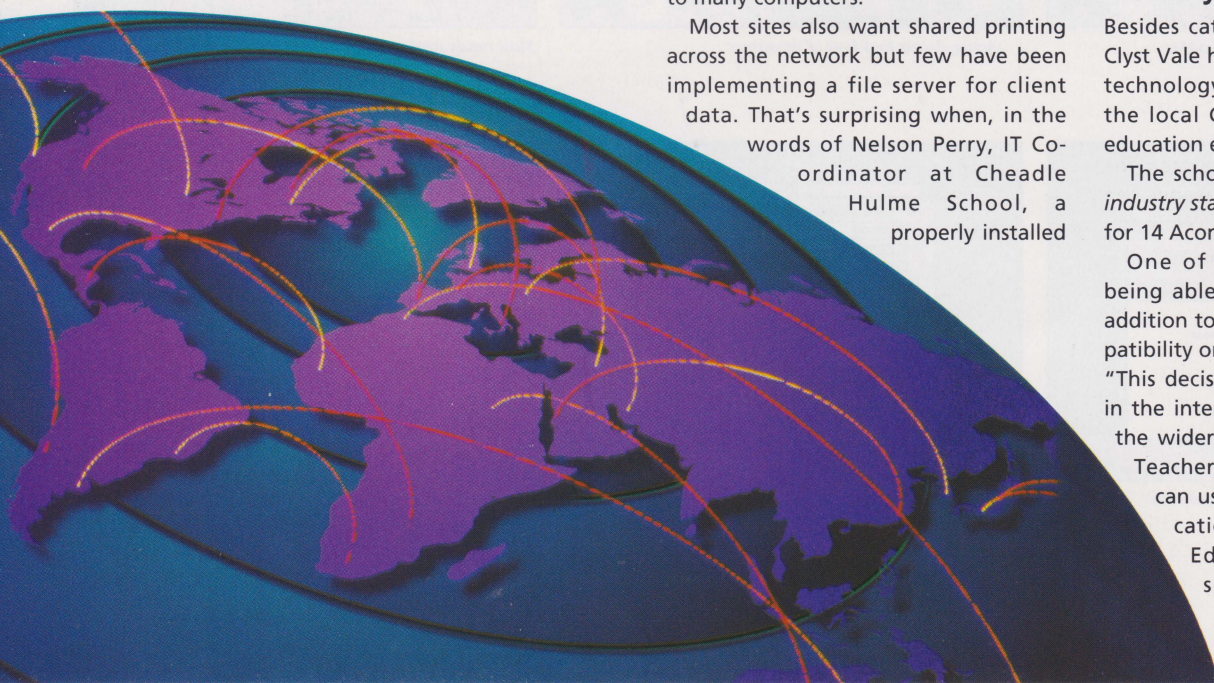
As Nelson Perry puts it, "We started this term by discarding 900 floppy discs of pupils' data." He could do so with confidence, for his file server is set up to provide unattended overnight back up. That's a far cry from pre-file server days when the only guarantee of preserving your daily changing data was – and for many schools still is – painstaking manual creation of back ups on a daily basis.

Industry standards

Besides catering for their own pupils, Clyst Vale has recently developed a new technology suite which also supports the local Community College's adult education evening courses.

The school governors looked at the industry standards and eventually opted for 14 Acorn Risc PCs.

One of the deciding factors was being able to take a 486 processor in addition to the ARM processor. PC compatibility only costing £99 per machine. "This decision maximises opportunities in the interests of both the school and the wider community," explains Head Teacher, Trevor Green. The IT staff can use the existing range of educational software, while Adult Education can buy business-specific software, yet both



it happen

are able to access the shared printers across the network.

Shared printing

The choice of printer is critical. At Torells Grant Maintained School in Grays, Essex, ExpLAN has installed both a PostScript laser and a PostScript colour printer. Torells' network of 30 computers is spread throughout a nine room technology department with lots of graphics software.

A high priority, according to Peter Ruddick, Head of Technology, was "the ability for each pupil get their printed output by the end of the lesson – not the end of the week".

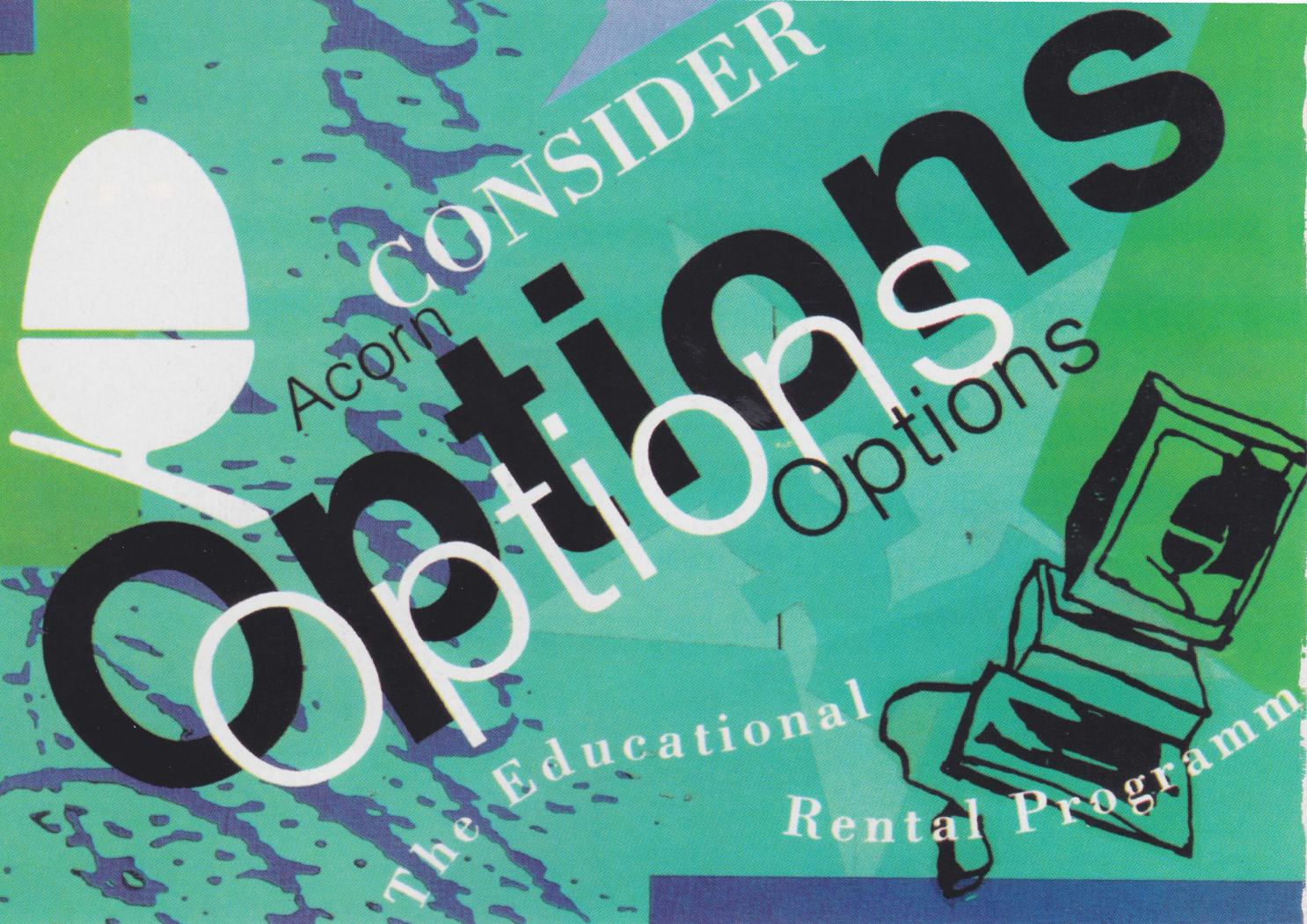
The amount of data needed to print an A4 page is often underestimated. In schools, the end-of-lesson bottleneck means that most pupils will be sending output to the printers during the same last five minutes. The network bandwidth required is enormous and the choice is between one big, fast printer, or several smaller and slower ones. In most cases a larger printer is preferable and cheaper.

For networking printers, the following guidelines apply:

- Top-end (expensive) printers are generally more reliable, and cheaper per page/minute of throughput required
- PostScript printers require significantly less network bandwidth and can hence increase the computer/printer ratio
- Use network printing software that spools to a hard disc and releases the client machines for the next lesson.

Paul Richardson is a director and network consultant with ExpLAN Computers Limited, one of Acorn's Education Dealers.





Footing the bill

Whether your network budget is £500 or £20,000, or anything in between, you get more for your money – more quality and more performance – from Acorn. Schools should take the time to carefully consider all of the financial alternatives available to them as they plan the increased use of computer-based educational resources throughout their curriculum.

What are the options?

Some schools are able to finance networking resources from their educational budgets. Other schools find their funds wanting but are able to explore possibilities such as using Local Education Authority capital funds to include the major cost of networking in a new building or renovation budget, where new trunking and network cabling can be laid at the same time.

Another possibility is to apply for 1995 GEST funds, which are dedicated to supporting school projects designed to increase learning effectiveness.

To give further assistance to schools, Acorn has introduced **Acorn Options**, a rental scheme which gives schools a new flexibility in meeting curriculum demands.

Managed by Anglo Direct, a member of the

strictly regulated Finance and Leasing Association, Acorn Options can eliminate financial hassle and offer schools real benefits such as:

- Acquiring state-of-the-art networking now, with the ability to upgrade equipment during the rental period as required
- Improving cash flow by spreading the cost of new purchases over three years
- Using revenue budget to take the strain off capital expenditure
- Choice of payment frequency (e.g. monthly, quarterly or annually)
- Providing flexibility with a 'change out' facility which allows the replacement of systems during the rental period
- Receiving the full support of Acorn's Extended On-Site Warranty and support from your local Acorn Dealer
- Inclusion of the costs of consultancy, installation, hardware, software and support all in one contract.

More information on Acorn
Options can be obtained
by ringing Anglo Direc
on 0161 832 6925